CellAir™ CO_2 Detector

- NDIR (Non-Dispersive Infrared) sensor
- Measures up to 50,000ppm
- Can handle up to 3 remote display units; 1 up to 25m away, 3 up to 8m apart
- Large LCD display indicates ambient CO_2 concentration and temperature
- Relay output to automatically control a fan to ventilate confined spaces
- Audible and visual alarm indications
- IP54 water proof protection

Application

Thankyou for selecting the Duomo CellAir™ CO_2 monitor. It is designed to detect the presence of carbon dioxide in the ambient air to protect people in confined spaces. High concentrations of CO_2 in confined spaces are dangerous, and may lead to health problems ranging from headaches and fatigue to asphyxiation and death. CellAir™ has an audible alarm and visual indication which will activate when CO_2 concentration reaches a pre-set level. Detection of high levels of CO_2 will also activate a relay that could be used for a fan to ventilate the confined space and reduce CO_2 concentration in the area. CellAir™ can be widely used in CO_2 storage areas, breweries, wineries, cellars, beverage dispensing areas and fast food outlets.

Package Contents

SEU (Sensor Unit), RDU (Remote Display Unit), panel holders, network cable connector, communication cable (8m length), fixtures and fittings, user manual.

Specifications

CO_2 Specification
Measurement range - 0 - 50,000ppm
Accuracy - ±100ppm or ±5% of reading
Temperature Specification
Measurement range - 0°C - 50°C (32°F - 122°F)
Alarm Levels
Alarm 1 - 0.5 / 1 / 1.5 / 2%
Alarm 2 - 1.5 / 2 / 2.5 / 3 / 3.5 / 4%
Operating Conditions
Operating temperature - 0°C - 40°C (32°F - 104°F)
Humidity range - 0 ~ 95%RH
Storage Conditions
Storage temperature - -20°C - 60°C (-4°F - 140°F)
Power Supply & Relay Output
AC adapter - 110/220 VAC
AC input - 100 ~ 240 VAC, 50/60Hz
AC output - 6 VDC, 1.8 W
Relay output - 30 VDC or 250 VAC, max. 2A, SPST, NO
Accuracy
Annual drift < 20ppm / year @ 400ppm
Calibration
User calibration via onboard menu system
Recommended calibration interval - 2 years

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SEU (Sensor Unit) Function Instruction

The SEU should be placed in a room where the CO_2 is likely to accumulate such as a room where CO_2 is stored, like an area with CO_2 beverages. The large LCD displays the ambient CO_2 concentration and the temperature.

The SEU has several functions. These are;

"DIAG" - Performs a communication test between the SEU and RDU.

"CALI" - Calibrates the unit to the ambient air.

"ReFactSet" - Restores the unit to its factory default settings.

"AL1"- Sets the 1st alarm level to 0.5, 1, 1.5 or 2% CO_2 concentration (default is 1.5%).

"AL2" - Sets the 2nd alarm level to 1.5, 2, 2.5, 3, 3.5 or 4% CO_2 concentration (default is 3%).

When CO_2 concentration exceeds the first alarm level, the red AL1 LED will blink and the alarm will sound intermittently. At this stage, the relay will be actuated. When levels drop back below the alarm level, the LED will stop blinking and the alarm will stop sounding.

When concentrations exceed the second alarm level, both AL1 and AL2 LED's will flash and the alarm will sound more quickly. The alarm will remain in this state until the ↺ button has been pressed.

In the case of very high concentrations, 'ESC' will appear on the screen of the unit. It is imperative that the area be completely ventilated and that no one enters the area until concentrations have dropped. To reset the unit, use the "ReFactSet" function.

RDU (Remote Display Unit) Function Instruction

The RDU (Remote Display Unit) should be placed outside the room which is being monitored. This unit is connected to the SEU by the communication cable provided. It should be placed where it can be conveniently seen before entering the room where the SEU is located. The RDU is a repeater and displays the measurements made by the SEU on an LCD. The RDU can be placed a maximum of 24 metres (78.7 feet) away from the SEU.

The RDU also has the "DIAG" function to test the comms between the SEU and the RDU.

Safety Notes

Warning: To ensure this product is used correctly and safely, please read these warnings and the entire user manual before use.

1. Please handle the device carefully; do not subject the product to impact or shock.
2. Do not place the unit, or the adaptor, near a heat source.
3. Do not touch the exposed electronic circuitry of the device under any circumstances.
4. Please only use the included power adaptor.
5. Make sure that the power adaptor is mounted using the plug lock so that it cannot be removed without the use of tools.
6. DO NOT enter the room when "ESC" is displayed on the LCD of the SEU or RDU. Some action must be taken before entering the room where the SEU is installed.

Maintenance

We recommend that users test the communication between the SEU and RDU using the "DIAG" function periodically. If the four LED's flash and the alarm sounds on both units then the system is functioning normally.

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Fault Codes & Troubleshooting Guide

LCD Fault Icon	Description	SEU Indication	RDU Indication	Suggested Action
Er3	The ambient temperature has exceeded the temperature range (0°C - 50°C)	"Er3" flashes, Fault LED flashes, Alarm sounds	"Er3" flashes, Fault LED flashes, Alarm sounds	This error will disappear when the temperature returns to within the acceptable range
Er4	There is an incorrect measurement or the sensor has exceeded its lifespan	"Er4" flashes, Fault LED flashes, Alarm sounds	"Er4" flashes, Fault LED flashes, Alarm sounds	Power the unit down, then back up. If "Er4" still appears, please return the unit to the dealer
Er5 Er6	EEPROM System problem	"Er5" & "Er6" flash, Fault LED flashes, Alarm sounds	"Er7" flashes, Fault LED flashes, Alarm sounds	Power the unit down, then back up. If "Er5" & "Er6" still appears, please return the unit to the dealer
Er7	Internal data transmission error	"Er7" flashes, Fault LED flashes, Alarm sounds	"Er7" flashes, Fault LED flashes, Alarm sounds	Power the unit down, then back up. Check the communication cable between the SEU and RDU
Er8	The accuracy of the CO_2 sensor may deviate from the actual CO_2 concentration	"Er8" flashes, Fault LED flashes, Alarm sounds	"Er8" flashes, Fault LED flashes, Alarm sounds	Power the unit down, then back up. If "Er8" still appears, please return the unit to the dealer

LCD Display Symbols

Symbol	Meaning	Description
509 PPM CO_2	CO_2 concentration (ppm)	Ambient CO_2 concentration
26.5 °C	Temperature (Celcius or Fahrenheit)	Ambient temperature
	Alarm	The unit is in alarm
DIAG	Diagnostic check	The communications between the SEU and RDU are being checked
AL1	First alarm level	CO_2 concentration exceeds the first alarm level. The relay has been activated
AL2	Second alarm level	CO_2 concentration exceeds the second alarm level. DO NOT ENTER THE ROOM.
CALI	Calibration	Calibrates the CO_2 sensor based on ambient CO_2 concentration
ReFactSet	Restore factory setting	Recovers factory default settings
ESC	Escape	The CO_2 level is above the second alarm level. Action must be taken.
Hi	High concentration	The CO2 concentration is above 5%

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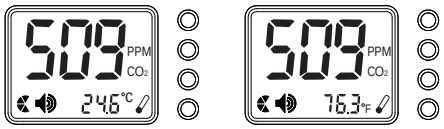
Customising Settings

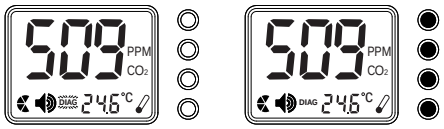
There are several settings on the CellAir™ that can be altered to personalise it for your application.

Temperature °C/°F



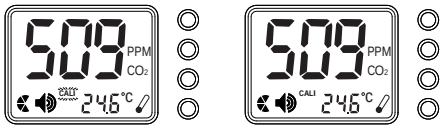
1. Press the ↵ button to switch between °C and °F

Using the "DIAG" function



1. Press the ▶ button until "DIAG" flashes
2. Press ↵, the four LED's on the SEU will flash and its alarm will sound
3. The four LED's on the RDU will flash and its alarm will sound

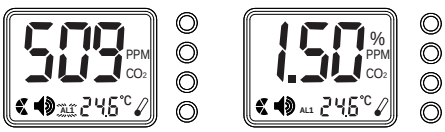
Using the "CALI" function



1. Press ▶ button until "CALI" flashes
2. Press ↵, the "CALI" icon shown on the LCD
3. Press and hold for at least 10 seconds. The "CALI" icon will flash and the unit will calibrate automatically. After 10 minutes the LCD will display "Pass" or "Fail". If "Fail" appears please try calibrating the unit again.

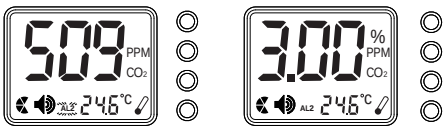
Note: If possible, calibrate the SEU outside in ambient air. Wait 10 minutes for the unit to stabilise before calibrating. DO NOT breathe on or near the unit during calibration.

Setting the first alarm parameter



1. Press ▶ button until "AL1" flashes
2. Press ↵, the "AL1" icon shown on the LCD
3. Press ▶ to go through the parameters
4. Press ↵ again to save the setting

Setting the second alarm parameter



1. Press ▶ button until "AL2" flashes
2. Press ↵, the "AL2" icon shown on the LCD
3. Press ▶ to go through the parameters
4. Press ↵ again to save the setting

Note: The second alarm level should be higher than the first alarm level.

Using the "ReFactSet" function

1. Press ▶ button until "ReFactSet" flashes
2. Press ↵, then ▶ to select either "Yes" or "No"
3. Press ↵ again to save the setting

Only use this function if you wish to return the sensor to its factory default settings, or if the unit displays "ESC" on the LCD under conditions of very high concentrations.

Installation Instructions

1. Choose a suitable location to install the SEU. Fix the panel holder on the wall at the recommended height of about 0.45m (1.5 feet) from the floor and as close to the manifolds and valves as possible.
2. Put the SEU on the panel holder, making sure the connection is tight.
3. Fix another panel holder in a suitable location outside the monitored space. Push the RDU onto the panel holder and stick the warning paper next to the RDU.
4. The communication cable is pre-wired to the SEU. Route this through to the RDU and plug it into the input port. Communication between the two units is now established.
5. The CellAir™ has one relay output which is pre-wired to the SEU. The relay can be used to operate an external alarm system or ventilation system. It will be triggered when the CO_2 concentration exceeds the first alarm level.
6. After completing the installation, remove the rubber cap from the gas entry point, power the unit up and use the "DIAG" function to verify the connection between the SEU and the RDU.

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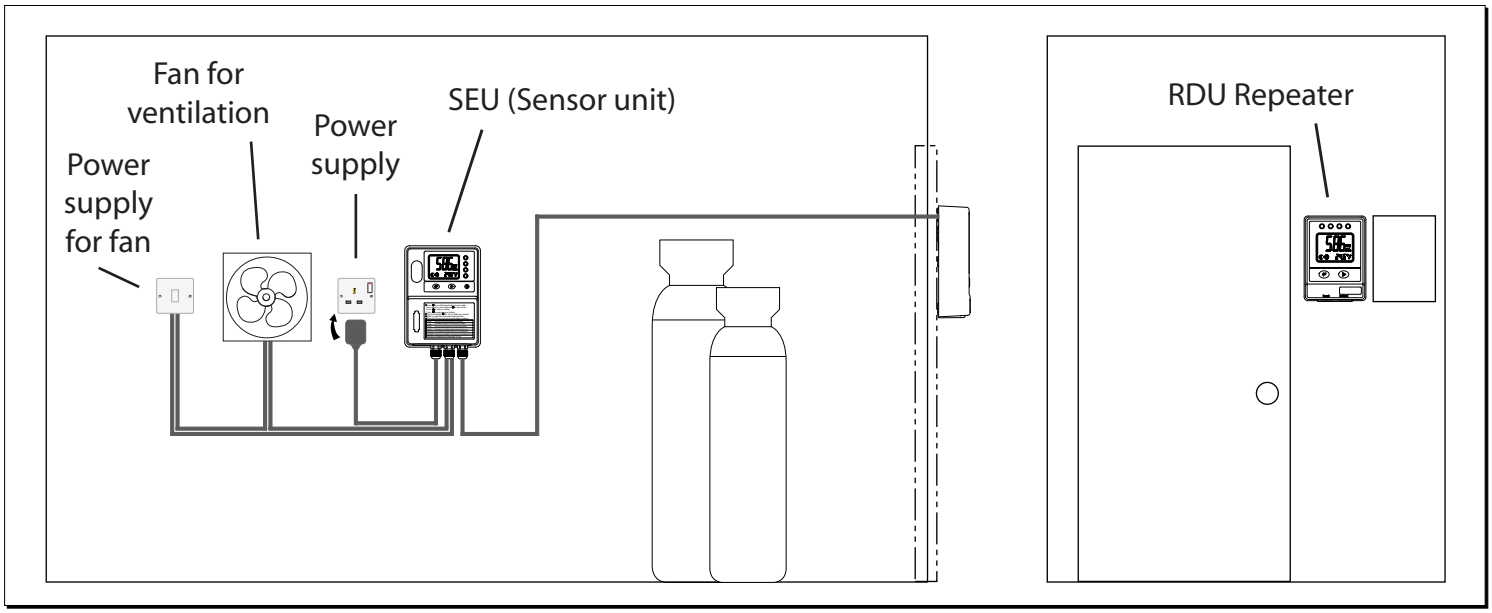
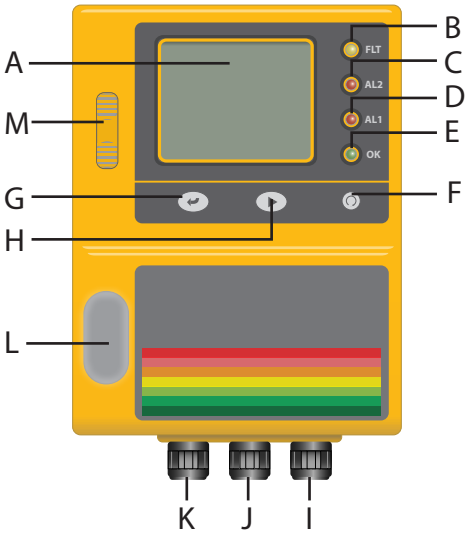
Installation

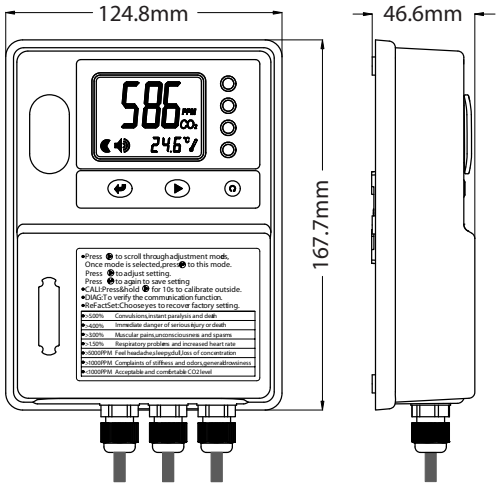
The diagram below details a typical installation scenario of the CellAir™ unit. For advice on where and how to install this unit please contact Duomo (UK) Ltd. on 01905 797989.

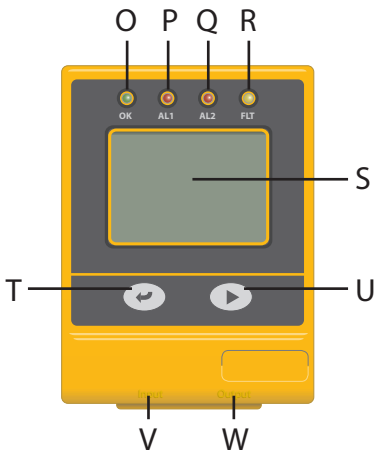


Layout & Dimensions

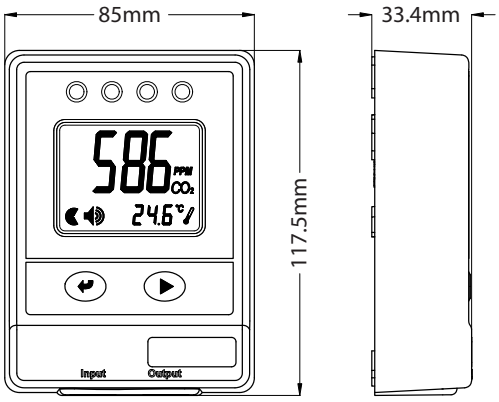


A. LCD display
B. FLT LED (Fault indication)
C. AL1 LED (Alarm 1)
D. AL2 LED (Alarm 2)
E. OK LED (Power indication)
F. Reset button
G. Mode button
H. Enter button
I. Communication cable to RDU
J. Relay output
K. Power supply
L. Rubber cap
M. Gas entry





O. OK LED (Power indication)
P. AL1 LED (Alarm 1)
Q. AL2 LED (Alarm 2)
R. FLT LED (Fault indication)
S. LCD display
T. Enter button
U. Mode button
V. RJ45 plug for SEU (Input)
W. RJ45 plug for next RDU (Output)



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